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Title: Imaging Radioactive Sources Using Autoradiography

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Imaging Radioactive Sources using Autoradiography

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Summer Fun

Kevin Glennon (C-NR)

- Education
  - B.S Chemistry; University of Arkansas, 2015
  - PhD candidate in chemistry, Texas A&M

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- Chemistry Division
  - Nuclear and Radiochemistry
  - Nuclear Chemistry team
  - Evelyn Bond

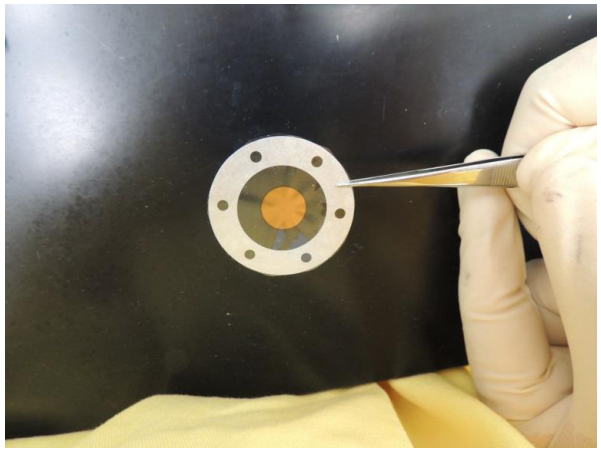
- Research
  - LANL: Imaging radioactive sources using autoradiography
  - Texas A&M: Developing new forensic techniques for the discrimination of separated Pu

Research Overview and Motivation

- Nuclear reactions are often performed by irradiating a stationary target nucleus with neutrons or an accelerated projectile nucleus

$$R = \sigma N_a \phi$$

- These targets are typically prepared by depositing material on thin metal, Mylar, or graphite foils
  - Electrodeposition
  - Evaporators
  - Chemical vapor deposition



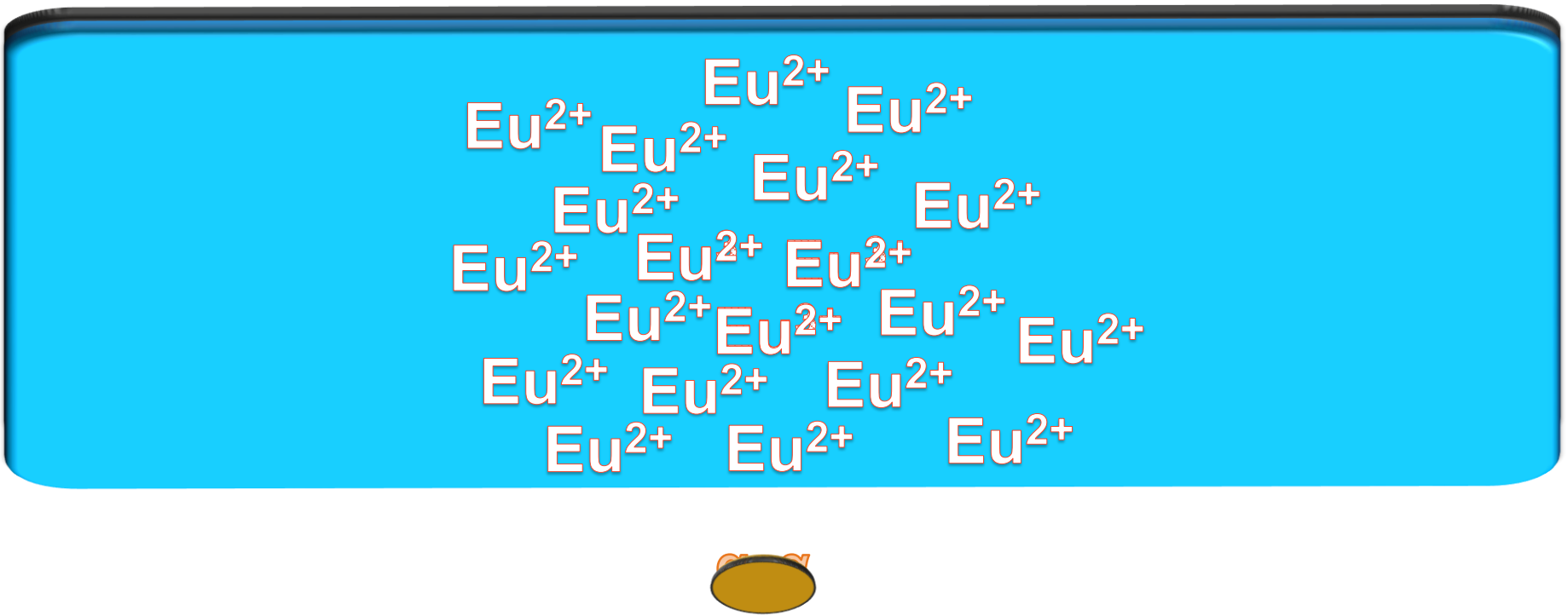
Research Approach

- Producing uniform targets is important for the success of a reaction
  - Cracked, rough, or irregular targets may waste beam

- The uniformity of a radioactive target may be assayed using autoradiography
  - Modern techniques use a photostimulated luminescent BaFBr:Eu^{2+} phosphor

$$O.D. = kE \qquad A = \frac{\Delta N}{t} = \frac{E/Q}{t}$$

$$E = Q * \Delta N \qquad A = \frac{O.D.}{k * Q * t}$$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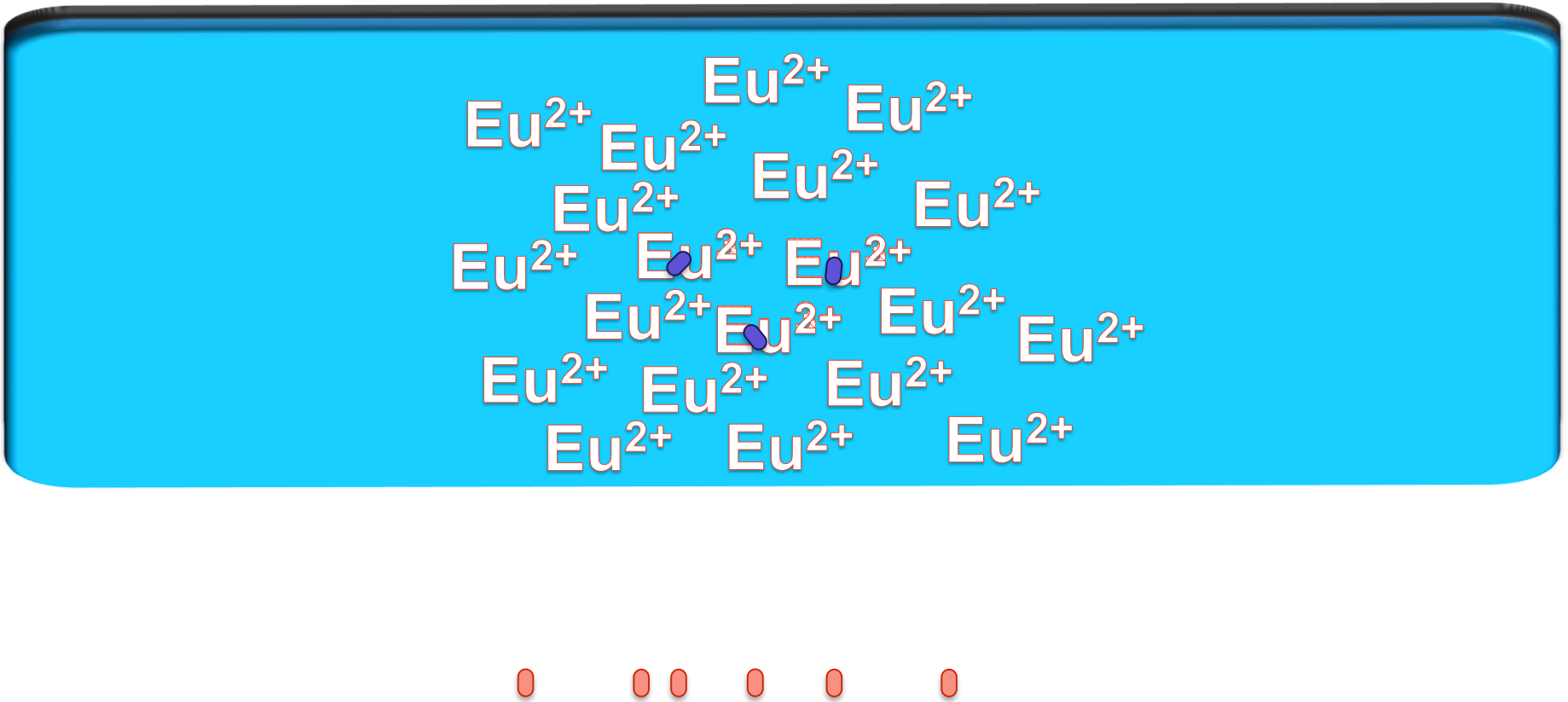
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Summary of Results